

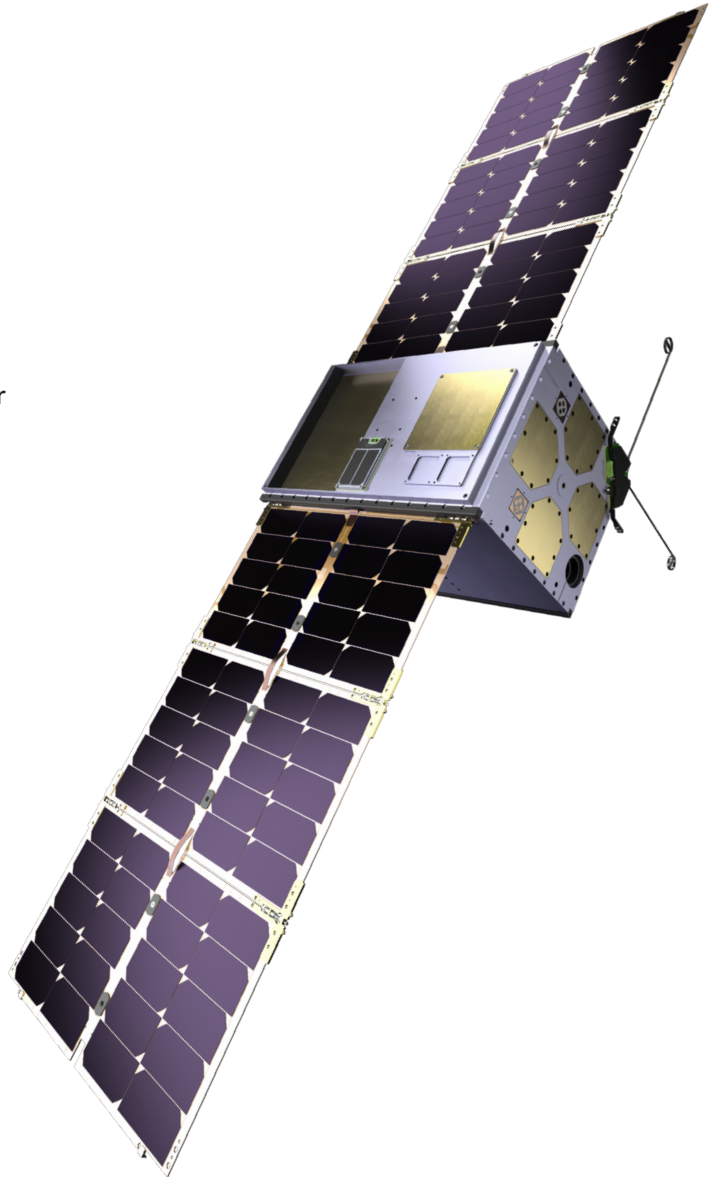
# RENEGADE

Terran Orbital presents the Renegade-class spacecraft platform, a standard point of departure 12U spacecraft. The Renegade has the best platform-to-payload mass ratio in the product line, leaving tremendous volume for capable instruments, and can accommodate a 19cm diameter optical imager. It proves that operational missions can be performed on a small platform.

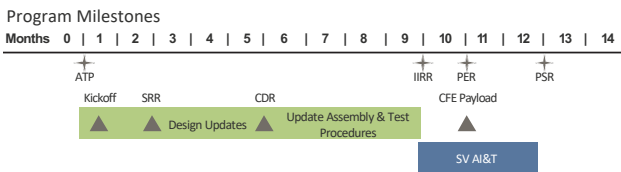
Renegade was based on the previous Trestles platform, with significant heritage in orbit. It can be easily customized as a 16U spacecraft. Terran Orbital's entire line of spacecraft shares the same avionics and GNC algorithms, though Renegade allows more room for power storage than the other nano and microsatellite platforms.

Renegade meets the requirements for 'rail' based dispensers, including those sold by Terran Orbital, and has a compact tri-fold solar array, providing more power to a payload than what is often available in this form factor.

Terran Orbital employs top-of-the-line automation and modern manufacturing processes to support the delivery of hundreds of buses annually. From order to launch, in quantities from one to a constellation of one hundred, Terran Orbital accelerates the delivery of mission solutions.



## RENEGADE (12U)



## KEY BENEFITS

- Exceptional available payload volume for size, allowing for complex operational systems
- Platform extendable from 12U to 16U for exceptionally long payloads
- Can accommodate up to a 19cm diameter optical imager
- Based on hardware with significant flight heritage



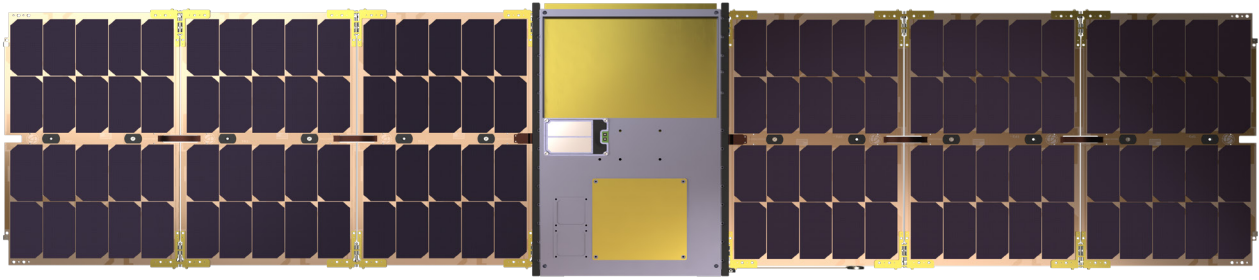
JULY 2024



15330 Barranca Parkway, Irvine, CA 92618

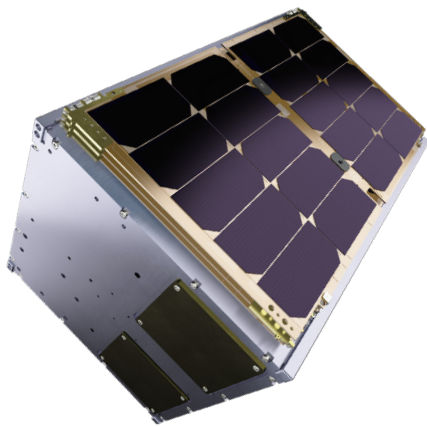
www.terranorbital.com  
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# RENEGADE



## BASELINE MODULES INCLUDED

- Flight Computer
- Backplane
- 12V Battery Modules(3)
- 12V MPPT (2)
- 12V Load Controller (1)
- Coarse Sensors (2)
- Star Trackers (2)
- GPS
- Magnetorquers (3)
- Reaction Wheels (3)
- LDRR Radio
- MDR Radio
- IMU (1)



## SPECIFICATIONS\*

|                                |  |
|--------------------------------|--|
| <b>Configuration</b>           | 12U (16U option)   |
| <b>Applications</b>            | LEO  |
| <b>Native Orbits</b>           | 400km - 1200km   |
| <b>Launch Mass (Wet)**</b>     | up to 25kg   |
| <b>Available Payload Mass</b>  | 10kg   |
| <b>Max Solar Array Power</b>   | 100W   |
| <b>Redundancy</b>              | Single-string  |
| <b>Power System</b>            | 12V Unreg, 3.3V, 5V rails available  |
| <b>Communication Data Rate</b> | UHF: 9.6 Kbps (U/L & D/L)<br>S-band: 125 Kbps U/L, 2 Mbps D/L<br>X-Band: 50 Mbps D/L |
| <b>Propulsion</b>              | None standard, options available   |
| <b>Pointing Accuracy</b>       | 30 to 75 arcseconds<br>higher accuracy available                                     |

\* For additional spacecraft specifications or to configure a platform for your requirements, please contact a sales professional.

\*\* maximum mass may not be supported on all launch vehicles or with all deployers.

# RENEGADE

## PRODUCTION FACILITIES

### 1288 MC COY



Fabrication and Machine Shop. Santa Maria, CA - 17,500 sf

### 50 TECHNOLOGY



Operated-Guided Subassembly/Satellite AI&T. Irvine, CA - 60,000 sf

Tyvak manufactures tight-tolerance mechanical parts for aerospace applications within its 17,500-ft<sup>2</sup> machine shop located in Santa Maria, CA, which boasts state-of-the-art CNC lathes and mills and precision metrology equipment. Once parts are machined and verified for tolerance, they are shipped to Tyvak's module and subassembly facilities in Irvine, CA, for bus/payload assembly, integration, and testing (AI&T) in our 60,000-ft<sup>2</sup> and 37,800-ft<sup>2</sup> state-of-the-art satellite manufacturing facilities. Within our 50 Technology facility, we house satellite bus assembly, satellite accessory fabrication, test labs with ESD-compliant lab benches, laminar flow benches, electronics and mechanical assembly areas,

### 15530 BARRANCA



Robotic Module AI&T. Irvine, CA - 37,800 sf

### 100 RIALTO



Payload AI&T. Melbourne, FL - 17,200 sf

a class 100,000 clean assembly area, thermal and thermal vacuum chambers, an electronics laboratory for module testing and verification, a large anechoic chamber, a dedicated RF laboratory, random vibration testing equipment, and extensive networking and computing infrastructure. In addition, Tyvak's 4,000-ft<sup>2</sup> dedicated ICD-705-compliant SCIF laboratory space enables assembly and integration of classified payloads at 50 Technology facility. This facility also features walled offices, open cubicle areas, and conference rooms to support over 100 engineering and administrative staff.



Satellite A&IT. Irvine, CA - 98,000 sf

### 4 GOODYEAR

#### WORLD'S LARGEST ROBOTIC SATELLITE ASSEMBLY FACILITY WILL INCREASE PRODUCTION CAPABILITIES ONCE LAUNCHED

In Q4 2024, Tyvak will bring online our new production facility that will significantly boost satellite production, increasing it from an estimated 10 satellites per month to more than 20 per month. This expansion includes two advanced Printed Circuit Board Assembly (PCBA) lines, a state-of-the-art testing facility equipped with a large shaker table and a Thermal Vacuum (TVAC) chamber, a wire harness facility, and new automated module testing facilities. All satellite assembly will be transitioned to the new 4 Goodyear facility enabling the dedication of Tyvak's existing facilities to the production of components and modules. This optimization will enhance the efficiency and capacity of Tyvak's entire production system.

# RENEGADE

## ABOUT US

Tyvak Nano-Satellite Systems, Inc. ("Tyvak"), a wholly owned subsidiary of Terran Orbital Corporation ("TOC"), was founded in 2013. Tyvak and TOC are U.S. corporations with 100% U.S. ownership. TOC manages a portfolio of business that provides end-to-end small satellite solutions and services. Tyvak is an end-to-end satellite solution provider that designs, integrates, and tests space vehicles and provides deployment and on-orbit services to its customers. Trusted by civil, defense, and commercial organizations, Tyvak has a proven track record of mission success. As a leader in satellite miniaturization, Tyvak designs and builds custom-architecture spacecraft in the nanosatellite, microsatellite, and minisatellite classes, providing launch solutions and aerospace technologies for a myriad of defense, intelligence, and scientific programs. Past missions have included autonomous rendezvous, proximity operations and docking, radar systems, science instruments, space situational awareness, technology demonstrations, remote sensing imagers, Earth observation telescopes, and more.

Tyvak provides customers with a single organization to lead various missions and the advantage of agility, innovation and the adaptation of new technologies. Our rapid speed, comprehensive expertise, and proven past performance makes us an ideal partner for critical space programs.



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NASA Goddard Space Flight Center  
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Greenbelt, MD 20771 USA  
Phone: 301-286-1289  
Email to: [rsdo@rsdo.gsfc.nasa.gov](mailto:rsdo@rsdo.gsfc.nasa.gov)



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